

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Algebra 2/Trig: Geometric Sequences

DO NOW: (Review)

a] Factor completely:  $2x^5 + 10x^3 - 12x$

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1) Examine this sequence: 4, 8, 16, 32, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...

a] Fill in the next few blanks.

b] What if I wanted to find the 15<sup>th</sup> term in this sequence? Can you do it?

c] What is the **common ratio** for this sequence?

d] What is the **1st term** for this sequence?

2) So we take the **1st term**, and keep multiplying the \_\_\_\_\_ over and over again. This is the definition of a **geometric sequence**.

3)  $(the\_nth\_term) = (the\_first\_term)(the\_common\_ratio)^{(n-1)}$

4) In other words...  $a_n = a_1(r)^{n-1}$

\*\*\*Make sure you can tell the difference between an **arithmetic** and **geometric** sequence!!!

5) If you keep **adding** the same thing over and over, it's an \_\_\_\_\_ sequence.

6) If you keep **multiplying** the same thing over and over, it's a \_\_\_\_\_ sequence.

7) Examine the following sequence: 2, 6, 18, 54, ...

a] What is the **1st term**?

b] What is the **common ratio**?

c] Find  $a_{11}$

d] What is the formula to find the **nth** term?

8) Examine the following sequence: 3, -4.5, 6.75, -10.125, ...

a] What is the **1st term**?

b] What is the **common ratio**?

c] Find  $a_{10}$  ("math enter enter")

d] What is the formula to find the **nth** term?

\*\*\*So the **common ratio** can be positive OR negative!!!

9) Find  $a_8$  for the following sequence: 6, -3,  $3/2$ ,  $-3/4$ , ...

10) Find  $a_8$  for the following sequence: 1,  $-1/2$ ,  $1/4$ ,  $-1/8$ , ...

11) How many terms are there in the sequence: 5, 15, 45, ..., 3645?

12) For a geometric sequence,  $a_1 = 3$  and  $a_4 = \frac{1}{9}$ . What is the formula for  $a_n$ ?

13) For a geometric sequence,  $a_2 = -9$  and  $a_5 = 243$ . What is the formula for  $a_n$ ?

14) Insert 4 geometric means between  $\frac{1}{9}$  and 27.

15) 5, 10, 20, 40, ...

a] common ratio:

b] formula for nth term:

c] Find  $a_{15}$

16) -11, 22, -44, 88, ...

a] common ratio:

b] formula for nth term:

c] Find  $a_{10}$

17) Find  $a_{14}$  for the sequence: 5, -10, 20, ...

18) Find  $a_6$  for the sequence: 3, -3/2, 3/4, ...

19) The first term of a geometric sequence is 6 and the 6<sup>th</sup> term is -3/16 Find the formula for  $a_n$ .

20) For a geometric sequence,  $a_5 = 3$  and  $a_{10} = 23,328$ . Find the formula for  $a_n$ .

21) Insert 3 geometric means between 2 and 162.

